

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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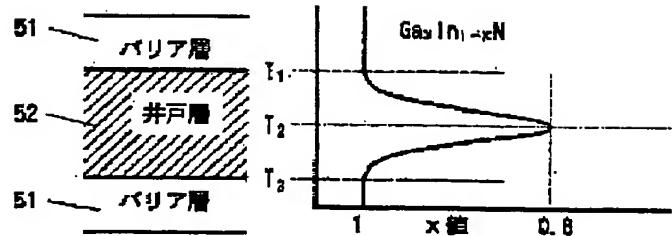
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TITLE : III ELEMENT NITRIDE  
SEMICONDUCTOR ELEMENT AND ITS  
MANUFACTURE



ABSTRACT : PROBLEM TO BE SOLVED: To avoid the occurrence of the mis fit or edge dislocation and enhance the crystallinity.

SOLUTION: A GaN barrier layer 51 of about 35  $\text{\AA}$  is formed by feeding specified amts. of  $\text{H}_2$ ,  $\text{NH}_3$ , and trimethyl Ga (TMG) at a substrate temp. of 900°C and well layer 52 of about 35  $\text{\AA}$  is formed by lowering the substrate temp. to 600°C, feeding specified amt. of  $\text{H}_2$  or  $\text{NH}_3$ , and trimethyl Ga (TMG), and changing the feed rates of trimethyl In. The In compsn. ratio of the layer 52 is approximately equal to that of the barrier layer 51 at interfaces  $T_1$ ,  $T_3$  therewith the continuously varies along the thickness so as to be max. at a center position  $T_2$  along the thickness, this smoothly coupling the lattice of the well layer 52 at the interface and suppressing the mis fit dislocation. The In compsn. ratio of the well layer 52 continuously varies along the thickness, thereby avoiding causing the edge dislocation due to the thermal expansion coefficient difference and improving the crystallinity.

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